Sulphur Springs Valley Electric Cooperative, Inc.
Small Residential, Single-Phase 120 V or 120/240 V, 20 kW or Less
Wind Generator System Interconnection Requirements
August 15, 2001

1.0 GENERAL REQUIREMENTS

1.1 The following wind generator system interconnection requirements by Sulphur Springs Valley Electric Cooperative, Inc. (SSVEC) are the minimum requirements by SSVEC to ensure proper interface of small residential, single-phase 120 V or 120/240 V, 20 kW or less, wind generator systems with the utility. In addition to the following minimum requirements, the customer is responsible for complying with all other applicable technical standards, safety codes, **National Electric Code**, and equipment manufacturers' specifications related to the design, installation, operation, and maintenance of the customer's entire electrical installation, including the wind generator system, not specifically mentioned in this document. **The Wind Generator System Components must be Listed by a Nationally Recognized Testing Laboratory (NRTL) to UL Standards.**

2.0 AGREEMENT PROCESS REQUIREMENTS

2.1 The customer contacts SSVEC and requests interconnection requirements. SSVEC will forward interconnection requirements (page 1 through 3), agreement form (page 4, 5, 6 and 7), and Rate Schedule Q1 to the customer.

2.2 The customer reviews the interconnection requirements, Rate Schedule Q1, and returns the signed and completed agreement form (page 4, 5, 6 and 7) to SSVEC, which verifies that the customer is in agreement with the interconnection requirements. SSVEC will not sign the agreement form authorizing parallel operation with the utility until section 2.6 is complete.

2.3 SSVEC will approve the agreement form, if the customer has submitted the correct information, and the customer has signed the agreement form. SSVEC will then verbally contact the customer, and give the customer permission to proceed with the wind generator project. The customer should not proceed with the wind generator project until SSVEC approves the agreement form, and verbally contacts the customer.

2.4 The customer must obtain all permits and inspections required by city or county inspectors regarding the installation of the wind generator system. The wind generator system must be installed by a licensed electrical or a wind generator contractor.

2.5 After the wind generator system has been installed, inspected, and approved by the city or county inspector, the customer should contact SSVEC. SSVEC will inspect the wind generator system installation to confirm that it complies with the interconnection requirements. SSVEC recommends the licensed electrical or wind generator contractor be on site when SSVEC inspects the wind generator system installation to answer any questions that SSVEC may have.

2.6 After SSVEC has inspected the wind generator system installation, and confirmed that it meets the interconnection requirements, SSVEC will then sign the agreement form, which authorizes the customer to operate the wind generator system in parallel with the utility. SSVEC will send copies of the completed agreement form to the customer.

3.0 POWER QUALITY REQUIREMENTS

3.1 The power quality at the customer's meter must be within **published national voltage (ANSI/IEEE Std C84.1) and harmonic (ANSI/IEEE Std 519) standards**. The wind generator system must not exceed SSVEC flicker standards, and must operate in synchronism with the utility at 60 Hz. The wind generator system must not inject direct current (DC) into the alternating current (AC) system. The electrical output of the customer's wind generator shall not contain harmonic content which may cause disturbances on or damage to SSVEC electrical system, or other customer's systems, such as but not limited to computer, telephone, communication and other electronic or control systems. SSVEC reserves the right to test the harmonic content of the wind generator system at a scheduled time between the customer and SSVEC personnel. If the customer's power quality does not meet these standards or if the wind generator system interferes with the power quality of other SSVEC customers, SSVEC reserves the right to disconnect the wind generator system from the utility.

4.0 PROTECTION REQUIREMENTS

4.1 The customer must ensure that the wind generator system automatically disconnects from the utility if SSVEC, or other personnel, open an upstream breaker, fuse, or switch to de-energize the utility power source to safely work on local area power lines or equipment. Without proper protection, the wind generator system could potentially backfeed the local area loads, and energize the local area power lines. This condition is called "islanding" and is extremely dangerous because SSVEC, or other personnel, will have assumed that they have isolated the utility power source, and could potentially be electrocuted by the customer's wind generator system backfeeding the utility. This situation is absolutely intolerable and it is the customer's responsibility to ensure that the wind generator system will automatically disconnect from the utility under these conditions.

4.2 Upstream SSVEC distribution breakers will trip open due to temporary faults (lightning strikes, etc.) and will automatically reclose 1-2 seconds later. Upstream SSVEC transmission breakers will also trip open due to temporary faults and will automatically reclose instantaneously. It is the customer's responsibility to ensure that the wind generator system has automatically disconnected from the utility before an upstream utility distribution or transmission breaker automatically recloses onto the wind generator system out of synchronism. SSVEC will not be responsible for any damage caused by an upstream utility breaker automatically reclosing onto the customer's wind generator system out of synchronism.

4.3 The following minimum protection is required by SSVEC to prevent the wind generator system from islanding the utility. The wind generator system must automatically disconnect from the utility 2 seconds (120 cycles) after the voltage deviates outside the voltage range 88-110% of nominal. The wind generator system must automatically disconnect from the utility 0.1 second (6 cycles) after the frequency deviates outside the frequency range of 59.3-60.5 Hz. After the PV system has disconnected from the utility, it should remain disconnected until voltage and frequency is within the above voltage and frequency ranges for 60 seconds.

4.4 In addition to the minimum protection required by SSVEC, it is the customer's responsibility to ensure that all additional personnel safety and equipment protection devices required by all other applicable technical standards, safety codes, and equipment manufacturers' specifications are properly installed. SSVEC is not responsible for the protection of the customer's wind generator system.

5.0 DISCONNECT SWITCH REQUIREMENTS

5.1 The customer shall install a SSVEC accessible, outdoor mounted, load break disconnect switch with a visible open that is capable of being padlocked in the open position by SSVEC personnel. The disconnect switch shall be mounted at the service entrance next to the meter, properly grounded, and clearly labeled **"WIND GENERATOR SYSTEM AC DISCONNECT**". The disconnect switch shall be installed on the alternating current (AC) circuit between the utility and AC input to the wind generator inverter. The purpose of the disconnect switch is for SSVEC, or other personnel, to disconnect the wind generator system from the utility to eliminate all potential sources of backfeed when it is necessary to safely work on local area power lines or equipment. The customer understands that SSVEC has the right to padlock the disconnect switch in the open position at any time, without notice to the customer. The customer also understands not to tamper with, or remove the padlock if the disconnect switch is padlocked in the open position by SSVEC.

6.0 ANNUAL INSPECTION

6.1 SSVEC may conduct at least one inspection annually, at no cost to the customer. The customer Shall provide SSVEC personnel with reasonable access to the wind generator system to conduct the annual inspection. This inspection will consist, at a minimum, of a visual inspection of required equipment and a test to verify that the equipment will still disconnect properly from the utility when utility power is disconnected.

7.0 RATE SCHEDULE INFORMATION

7.1 A copy of SSVEC's Rate Schedule Q1 that has been approved by the Arizona Corporation Commission (ACC) is included after the agreement form. Please review the rate schedule and indicate on the agreement form the preferred billing method.

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Please print the following information.

Customer Information

Customer Name_____

Customer Street Address_____

Customer Mailing Address_____

Customer Telephone Number_____

Wind Generator Information

Complete for rotating generators only.

Manufacturer_____

Type_____

Nameplate Rating:

Voltage_____ kW_____

Power Factor_____ Frequency_____

Model No._____ Single or Three Phase_____

Type of Excitation System (Self or Separate)_____

Number of Units_____

Interface Equipment

Complete for rotating generators only.

Synchronizer for Synchronous Generator:

Manufacturer_____

Manufacturer's Reference Number_____

Automatic or Manual Synchronizer_____

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Inverter for DC Generator:
Manufacturer_____

Manufacturer's Reference Number_____

Line or Self Commutated Inverter_____

No. of Units_____

Wind Generator Inverter Information (Complete for DC to AC Inverters Only)

Manufacturer_____

Model Number_____

Number of Units_____

AC Output Voltage (120 V or 120/240 V AC)_____

Total Power Output (kVA or kW)_____

Nameplate kW_____

Single, Split or Three Phase_____

Frequency_____

Line or Self Commutated_____

Power Factor_____

Energy or Fuel Source_____

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Protection Information

Please list the available range of protection settings, which should include pickup values and time delays.

Under/Over Voltage Protection_____

Under/Over Frequency Protection_____

Under/Over Current Protection _____

Other Protection_____

Installation Information

The wind generator system has been installed in compliance with all technical standards, safety codes and the latest edition of the National Electric Code.

Installer (signed)_____

Name (print)_____

Mail Address_____

Telephone Number_____

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Additional Information

The customer must include an electrical one-line and three-line diagrams of the Wind Generator installation with this agreement form. The electrical one-line and three-line diagram must show connections, circuit breakers, fuses, etc. between main electrical components such as meter(s), main panel, disconnect switch, inverter(s), sub-panel, loads, etc. The customer must include a detailed map that shows major cross roads and plant locations. A Site Plan must be submitted showing arrangement of major equipment and the Disconnect Switch. The licensed electrical contractor should be able to provide the one-line diagram, three-line diagram, detailed map, and site plan.

Preferred Billing Method

After reviewing SSVEC's Rate Schedule Q1, please select the preferred billing method.

_____Simultaneous Buy/Sell Mode, Net Bill Method

_____Simultaneous Buy/Sell Mode, Separate Bill Method

_____Parallel Mode

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By signing below, the customer understands, and is in agreement with, Sulphur Springs Valley Electric Cooperative, Inc. Wind Generator System Interconnection Requirements. The customer should not proceed with the wind generator project until SSVEC verbally contacts the customer and indicates approval of the information supplied by the customer on the agreement form. The customer should not operate the wind generator system in parallel with the utility until SSVEC has approved the wind generator installation and has signed below.

_____ _____

Customer's Signature Date

By signing below, Sulphur Springs Valley Electric Cooperative, Inc. has inspected and confirmed that the customer's wind generator system installation has met Sulphur Springs Valley Electric Cooperative, Inc. Wind Generator System Interconnection Requirements, and therefore, the customer is authorized to operate the wind generator system in parallel with the utility.

_____ _____

SSVEC's Signature Date

SSVEC WILL NOT ASSUME ANY RESPONSIBILITY FOR THE PROTECTION OF THE CUSTOMER'S GENERATOR(S), OR OF ANY OTHER PORTION OF THE CUSTOMER'S ELECTRICAL EQUIPMENT. THE CUSTOMER IS FULLY AND SOLELY RESPONSIBLE FOR PROTECTING THEIR EQUIPMENT IN A MANNER TO PREVENT ANY FAULTS OR OTHER DISTURBANCES FROM DAMAGING THE CUSTOMER'S EQUIPMENT.